Writing Performance DLLs for the VTune™ Performance Analyzer

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Contents

Introduction

A performance DLL enables the tracking of performance counters that exist in the following:

- Applications
- Operating systems
- Device drivers
- Hardware

Performance counters are implemented using software variables or hardware registers. An example of a performance counter is one that counts the throughput of bytes to and from a server application. Performance DLLs enable the VTune Performance Analyzer to monitor performance counters.

Who Should Read This Paper?

You should read this paper if you are a developer or an engineering manager interested in improving the quality and performance of a hardware device or software application in less time. This white paper provides an overview explaining how using Performance DLLs with the VTune analyzer can help you:

- Speed development time
- Add and validate new features
- Debug code
- Tune for performance

Where Can I Get Performance DLLs?

Intel is working with hardware and software developers to provide Performance DLLs for future products. Key new areas where counters are made available include:

- Graphics
- Networking
- Storage and I/O equipment vendors

Contact your hardware vendor to find out what third-party Performance DLLs are available.

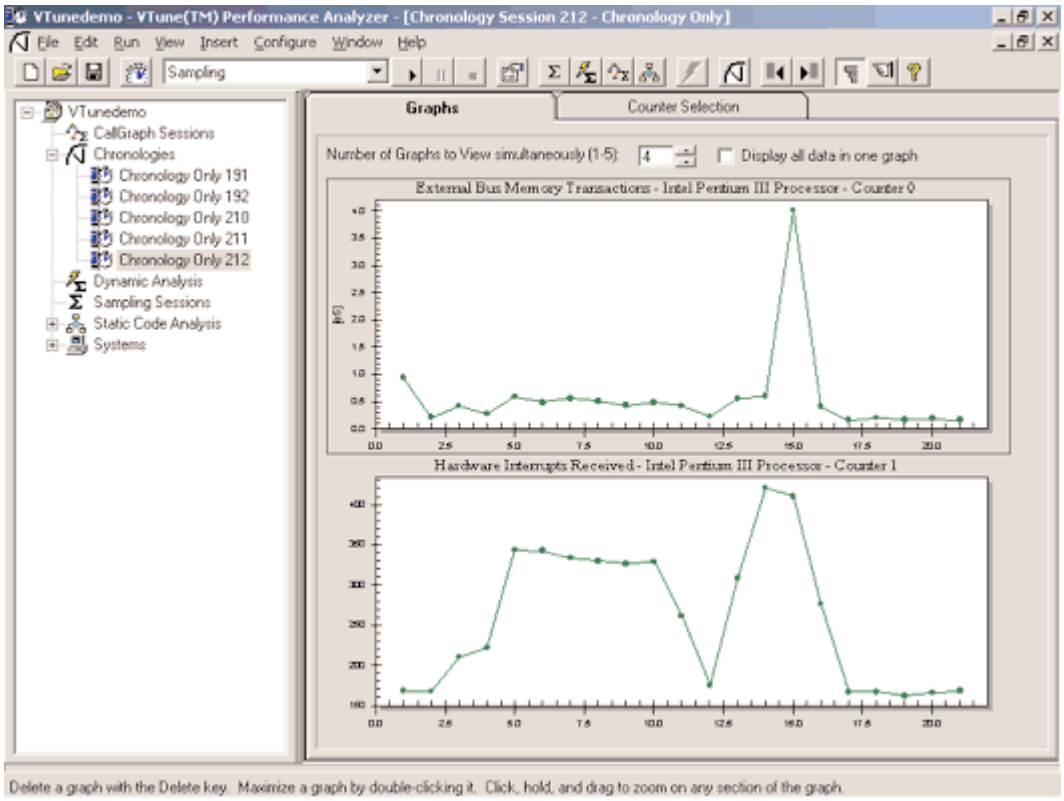
To build your own Performance DLL for the VTune analyzer, download the SDK at: `http:developer.intel.com/software/products/vtune/vtperfdll` or send an e-mail to: `perftool.feedback@intel.com` with `VTPERFDLL` in the subject line.

Why Use Performance DLLs?

Performance DLLs enable you to create a dashboard for your application or hardware. With little effort, you can provide access to performance data that developers can use to quickly debug, or monitor and improve the performance of your product.

Using a Performance DLL, the VTune analyzer collects counter data and generates a graph, called a chronology, which visually depicts how your hardware or software application is working over time.

In addition, the VTune analyzer allows you to drill down into the chronology graph. You can designate a time-slice for further analysis. You can quickly zoom in on the active modules during that time slice, and then to the source code. From the Source View, the Code Coach can be invoked for code-level tuning advice. Modifications can be easily tracked by comparing data from the same time-slice for different sessions.



The Chronology graph visually displays counter activity

Russell Huonder, a graphics engineer at 3Dlabs Inc., built a VTune analyzer Performance DLL to track counters in graphics hardware. The counter data generated by the VTune analyzer allows the engineers at 3Dlabs to tune video driver performance and validate driver changes.

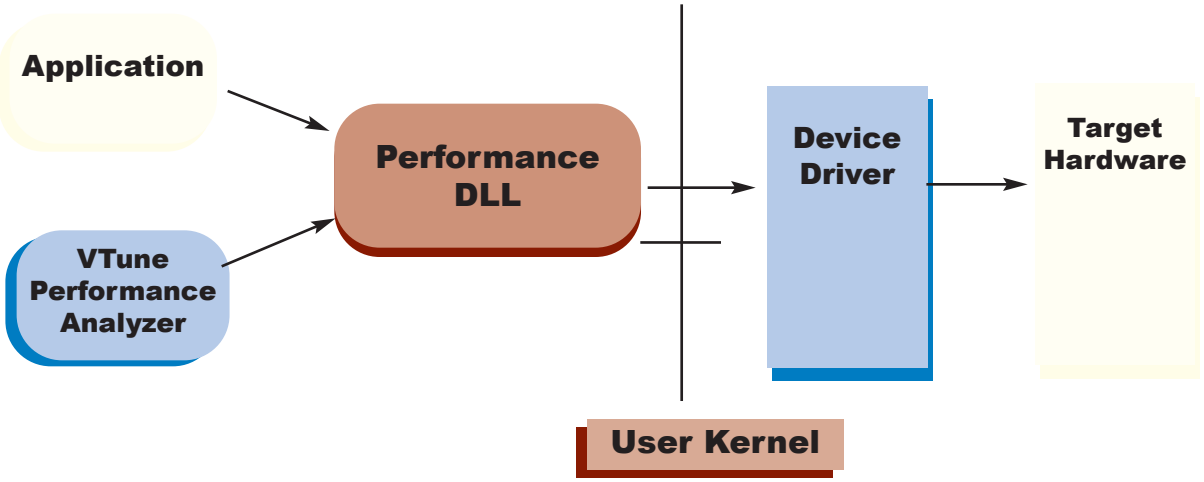
Russell built a working DLL that was constructed and ready for testing in about two weeks. When asked about his progress during testing, he commented,

> *It has worked really well. We are keeping close tabs on our hardware using this tool, and it definitely had helped us in our tuning efforts. Our hardware staff will be adding more counters with more functionality in the future based on the fact that we can easily get to them and display them.*
>
> *Russell Huonder*
> *Graphics Software Engineer*
> *3Dlabs Incorporated*

The engineers at 3DLabs are able to take Russell's VTune analyzer Performance DLL and modify it by adding counters for new projects. They will be using the VTune analyzer Performance DLLs to aid in making decisions regarding product updates, new features, optimization techniques, and maximizing speed.

Technical Overview

A Performance DLL is a VTune Performance Analyzer plug-in, developed by an IHV or ISV, that enables the VTune analyzer to collect and analyze performance counter data from hardware (via a device driver) or software applications.



Using the VTune analyzer Performance DLL SDK, you can create a functioning Performance DLL in as little as 10 minutes. Developing a Performance DLL consists of:

1. Defining the counters to be exported from your hardware or application.
2. Filling in a source code template created by a Microsoft* Visual Studio Project Wizard.

To complete a performance DLL, five function templates must be filled in:

`open`	Create a connection to your device driver or application
`initialize_counters`	Create a list of available performance counters supported by your hardware or application
`program_counter`	Activate one or more counters from the available counter list
`collect`	Read your performance counters and return the data to the VTune analyzer
`close`	Close the connection to your device driver or application

Once the performance DLL is complete, registering the DLL makes it available for use by the VTune analyzer.

Summary

Performance DLLs allow the VTune analyzer to communicate with your device or software application so that it can track counter data that can be used for performance tuning, validating new features, and debugging code. This can save valuable time in the development process, add quality to the product through new features and cleaner code, and increase performance.

More Information

For more information on the VTune Performance Analyzer, visit our Web site at: `http://developer.intel.com/software/products/vtune/.`